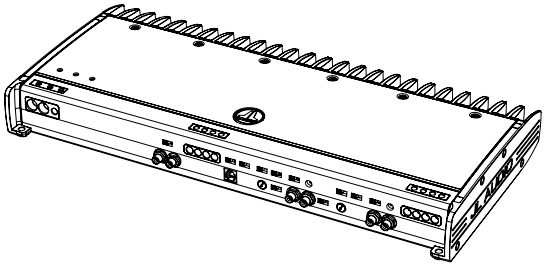
OWNER'S MANUAL

450/4v2

four-channel system amplifier



Thank you for purchasing a JL Audio amplifier for your automotive sound system.

Your amplifier has been designed and manufactured to exacting standards in order to ensure years of musical enjoyment in your vehicle. For maximum performance and extended warranty coverage, we highly recommend that you have your new amplifier installed by an authorized JL Audio dealer. Your authorized dealer has the training, expertise and installation equipment to ensure optimum performance from this product. Should you decide to install the amplifier yourself, please take the time to read this manual thoroughly so as to familiarize yourself with its installation requirements and setup procedures.

If you have any questions regarding the instructions in this manual or any aspect of your amplifier's operation, please contact your authorized JL Audio dealer for assistance. If you need further assistance, please call the JL Audio Technical Support Department at (954) 443-1100 during business hours.

PROTECT YOUR HEARING!

We value you as a long-term customer. For that reason, we urge you to practice restraint in the operation of this product so as not to damage your hearing and that of others in your vehicle. Studies have shown that continuous exposure to high sound pressure levels can lead to permanent (irreparable) hearing loss. This and all other high-power amplifiers are capable of producing such high sound pressure levels when connected to a speaker system. Please limit your continuous exposure to high volume levels.

While driving, operate your audio system in a manner that still allows you to hear necessary noises to operate your vehicle safely (horns, sirens, etc.).

SERIAL NUMBER

In the event that your amplifier requires service or is ever stolen, you will need to have a record of the product's serial number. Please take the time to enter that number in the space provided below. The serial number can be found on the bottom panel of the amplifier and on the amplifier packaging.

Serial Number:

_____

INSTALLATION APPLICATIONS

This amplifier is designed for operation in vehicles with 12V, negative-ground electrical systems. Use of this product in vehicles with positive ground and/or voltages other than 12V may result in damage to the product and will void the warranty.

This product is not certified or approved for use in aircraft.

Do not attempt to "bridge" the outputs of this amplifier with the outputs of a second amplifier, including an identical one.

PLANNING YOUR INSTALLATION

It is important that you take the time to read this manual and that you plan out your installation carefully. The following are some considerations that you must take into account when planning your installation.

Cooling Efficiency Considerations:

Your JL Audio amplifier employs an advanced type of heat management, called RealSink™. This feature takes advantage of convection and radiation effects to remove heat from the amplifier circuitry. For optimum cooling performance, the vertical heat sinks located at the back of the amplifier should be exposed to as large a volume of air as possible. Enclosing the amplifier in a small, poorly ventilated chamber can lead to excessive heat build-up and degraded performance. If an installation calls for an enclosure around the amplifier, we recommend that this enclosure be ventilated with the aid of a fan. In normal applications, fan-cooling is not necessary, but you still need to follow some basic guidelines:

- Amplifier mounted vertically with heat sink fins pointing up: Optimum
- Amplifier mounted horizontally, right side up: Good
- Amplifier mounted horizontally, but upside down: Fair (not recommended if there is less than 1 inch (2.5 cm) clearance above the amplifier heat sinks)
- Amplifier mounted vertically with heat sink fins pointing laterally: Fair
- Amplifier mounted vertically with heat sink fins pointing down: Poor (not recommended)

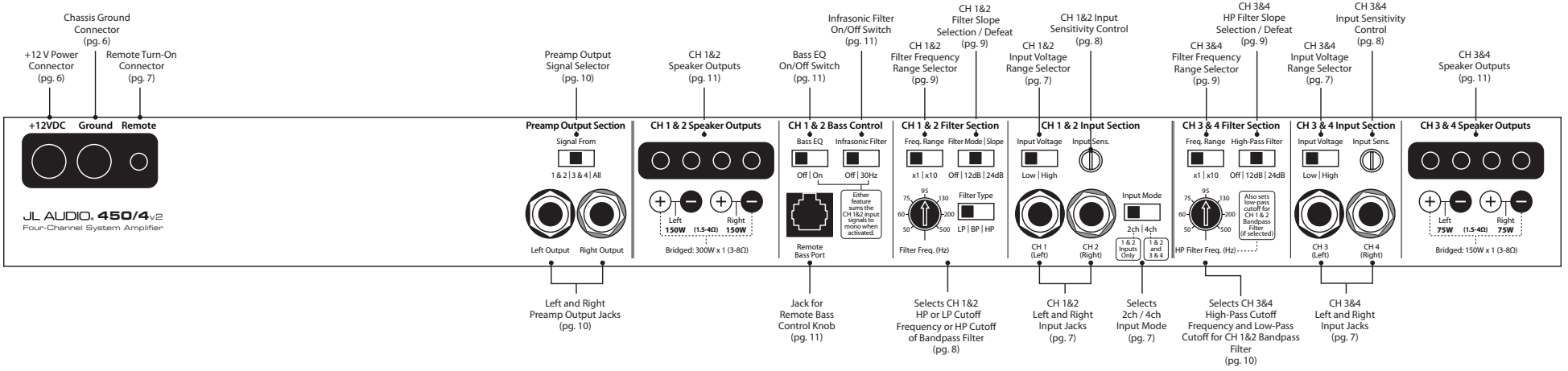
If mounting the amplifier under a seat, make sure there is at least 1 inch (2.5 cm) of space above the amplifier's outer shell to permit proper cooling.

Safety Considerations:

Your amplifier needs to be installed in a dry, well-ventilated environment and in a manner which does not interfere with your vehicle's safety equipment (air bags, seat belt systems, ABS brake systems, etc.). You should also take the time to securely mount the amplifier using appropriate hardware so that it does not come loose in the event of a collision or a sudden jolt to the vehicle.

Stupid Mistakes to Avoid:

- Check before drilling any holes in your vehicle to make sure that you will not be drilling through a gas tank, brake line, wiring harness or other vital vehicle system.
- Do not run system wiring outside or underneath the vehicle. This is an extremely dangerous practice which can result in severe damage to your vehicle and person.
- Protect all system wires from sharp metal edges and wear by carefully routing them, tying them down and using grommets and loom where appropriate.
- Do not mount the amplifier in the engine compartment, under the vehicle, on the roof or in any other area that will expose the amplifier circuitry to the elements.


Chassis Ground Connector (pg. 6)
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+12VDC
Ground
Remote
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Four-Channel System Amplifier
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Preamp Output Section
Signal From
1 & 2 | 3 & 4 | All
Left Output
Right Output
CH 1 & 2 Speaker Outputs
Left 150W (1.5-4Ω)
Right 150W
Bridged: 300W x 1 (3-8Ω)
CH 1 & 2 Bass Control
Bass EQ
Off | On
Infrasonic Filter
Off | 30Hz
Remote Bass Port
CH 1 & 2 Filter Section
Freq. Range
x1 | x10
Filter Mode | Slope
Off | 12dB | 24dB
Filter Type
LP | BP | HP
Filter Freq. (Hz)
CH 1 & 2 Input Section
Input Voltage
Low | High
Input Sens.
CH 1 (Left)
CH 2 (Right)
Input Mode
2ch | 4ch
1 & 2 Inputs Only
1 & 2 and 3 & 4
CH 3 & 4 Filter Section
Freq. Range
x1 | x10
High-Pass Filter
Off | 12dB | 24dB
HP Filter Freq. (Hz)
CH 3 & 4 Input Section
Input Voltage
Low | High
Input Sens.
CH 3 (Left)
CH 4 (Right)
CH 3 & 4 Speaker Outputs
Left 75W (1.5-4Ω)
Right 75W
Bridged: 150W x 1 (3-8Ω)
Left and Right Preamp Output Jacks (pg. 10)
Jack for Remote Bass Control Knob (pg. 11)
Selects CH 1&2 HP or LP Cutoff Frequency or HP Cutoff of Bandpass Filter (pg. 8)
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CH 3&4 Left and Right Input Jacks (pg. 7)

PRODUCT DESCRIPTION

The JL Audio 450/4v2 is a four-channel system amplifier utilizing patented Absolute Symmetry™ Class AB technology for all channels. All channels benefit from JL Audio's exclusive R.I.P.S. power supply design which optimizes the output of each channel pair for any impedance between 1.5 and 4 ohms per channel.

The staggered power distribution of the 1&2 and 3&4 channel pairs (150W x 2 for CH 1&2 and 75 x 2 for CH 3&4) allows for a wide variety of application options. The 450/4v2 can be operated in the following modes:

1) As a full-system amplifier in bi-amp mode with CH 1&2 driving subwoofers in low-pass mode (150W x 1 or 300W x 1) and CH 3&4 driving main speakers in high-pass mode (75W x 2).
2) As a high power four-channel satellite amplifier in a bi-amplified system, delivering high-passed signals to front and rear speaker systems. In this mode, we recommend that CH 1&2 drive the front speaker systems and CH 3&4 drive the rear speaker systems. Preamp outputs permit connection of a separate amplifier to drive the subwoofer system.
3) As a high power four-channel satellite amplifier in a tri-amplified system, delivering band-passed signals through CH 1&2 to mid-bass speakers and high-passed signals through CH 3&4 to mid-range/ tweeter speaker systems. Preamp outputs permit connection of a separate amplifier to drive the subwoofer system.
4) As a high power three-channel satellite amplifier, delivering 150W x 3 at 4Ω in high-pass mode to left, center and right speaker systems. This requires bridging the outputs of CH 3&4 to create an equal power third channel to complement CH 1&2. Preamp outputs permit connection of a separate amplifier to drive the subwoofer system.

The 450/4v2's flexible input and crossover sections permit operation with a wide variety of source units and system configurations. The 450/4v2 can operate with a single pair of stereo inputs or with separate inputs for CH 1&2 and CH 3&4, if the source unit is equipped with front and rear outputs. The 450/4v2's preamp output can send pass-through signals from the CH 1&2 inputs only or the CH 3&4 inputs only or it can sum all four input channels to feed a subwoofer amplifier. This latter mode allows for non-fading sub-bass with front to rear satellite fading.

As we said, it's very flexible.

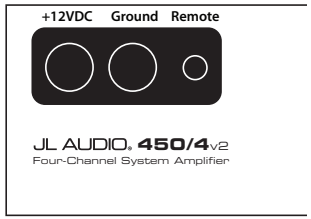
TYPICAL INSTALLATION SEQUENCE

The following represents the sequence for a typical amplifier installation, using an aftermarket source unit or OEM Interface processor (like the CleanSweep® CL441dsp). Additional steps and different procedures may be required in some applications. If you have any questions, please contact your authorized JL Audio dealer for assistance.

1) Disconnect the negative battery post connection and secure the disconnected cable to prevent accidental re-connection during installation. **This step is not optional!**
2) Run power wire (minimum 4 AWG) from the battery location to the amplifier mounting location, taking care to route it in such a way that it will not be damaged and will not interfere with vehicle operation. Use 2 AWG or 1/0 AWG power wire if additional amplifiers are being installed with the 450/4v2.
3) Connect power wire to the positive battery post. Fuse the wire with an appropriate fuse block (and connectors) within 18 inches (45 cm) wire length of the positive battery post. This fuse is essential to protect the vehicle. Do not install the fuse until the power wire has been connected to the amplifier.
4) Run signal cables (RCA cables) and remote turn-on wire from the source unit to the amplifier mounting location.
5) Run speaker wire from the speaker systems to the amplifier mounting location.
6) Find a good, solid metal grounding point close to the amplifier and connect the negative power wire to it using appropriate hardware. Use minimum 4 AWG power wire, no longer than 36 inches (90 cm) from the amplifier to the ground connection point. In some vehicles, it may be necessary to upgrade the battery ground wire. (See page 6 for important notice).
7) Securely mount the amplifier using appropriate hardware.
8) Connect the positive and negative power wires to the amplifier. A fuse near the amplifier is not necessary.
9) Connect the remote turn-on wire to the amplifier.
10) Connect the RCA input cables to the amplifier.
11) Connect the speaker wires to the amplifier.
12) Carefully review the amplifier's control settings to make sure that they are set according to the needs of the system.
13) Install power wire fuse (60A for a single 450/4v2) and reconnect the negative battery post terminal.
14) Turn on the source unit at a low level to double-check that the amplifier is configured correctly. Resist the temptation to crank it up until you have verified the control settings.
15) Make necessary adjustments to the input sensitivity controls to obtain the right overall output and the desired balance in the system. See Appendix B (page 22) for the recommended input sensitivity setting method.
16) Enjoy the fruits of your labor with your favorite music.

POWER CONNECTIONS

Before installing the amplifier, disconnect the negative (ground) wire from the vehicle's battery. This will prevent accidental damage to the system, the vehicle and your body during installation.



The 450/4v2's "**+12 VDC**" and "**Ground**" connections are designed to accept 4 AWG power wire. 4 AWG is the only recommended power wire size for this amplifier.

If you are installing the 450/4v2 with other amplifiers and wish to use a single main power wire, use 2 AWG or 1/0 AWG main power wire (depending on the overall current demands of all the amplifiers in the system). This 2 AWG or 1/0 AWG power wire should terminate into a distribution block mounted as close to the amplifiers as possible and should connect to the 450/4v2 with 4 AWG power wire.

Note: Smaller AWG numbers mean bigger wire and vice-versa (1/0 AWG is the largest, 2 AWG is smaller, then 4 AWG, then 8 AWG, etc.).

To connect the power wires to the amplifier, first back out the set screw on the top of the amplifier, using the supplied 2.5 mm hex wrench. Strip 1/2 inch (12 mm) of insulation from the end of each wire and insert the bare wire into the receptacle on the front panel of the amplifier, seating it firmly so that no bare wire is exposed. While holding the wire in place, tighten the set screw firmly, taking care not to strip the head of the screw.

The ground connection should be made using the same gauge wire as the power connection (4 AWG) and should be kept as short as possible, while accessing a solid piece of sheet metal in the vehicle. The surface of the sheet metal should be sanded at the contact point to create a clean, metal-to-metal connection between the chassis and the termination of the ground wire. For optimal grounding, we recommend the use of a JL Audio ECS master ground lug (XB-MGLU). Alternatively, a sheet metal screw or bolt can be used with a star washer.

Any wires run through metal barriers (such as firewalls), must be protected with a high quality insulating grommet to prevent damage to the insulation of the wire. Failure to do so may result in a dangerous short circuit.

! IMPORTANT

Many vehicles employ small (10 AWG - 6 AWG) wire to ground the battery to the vehicle chassis and to connect the alternator's positive connection to the battery. To prevent voltage drops, these wires should be upgraded to 4 AWG when installing amplifier systems with main fuse ratings above 60A.

Fuse Requirements

It is absolutely vital that the main power wire(s) to the amplifier(s) in the system be fused within 18 inches (45 cm) of the positive battery post connection. The fuse value at each power wire should be high enough for all of the equipment being run from that power wire. If only the 450/4v2 is being run from that power wire, we recommend a 60A fuse be used. AGU (big glass fuse) or MaxiFuse™ (big plastic-body fuse) types are recommended.

No fuse is required or recommended directly before the amplifier power connection. If one is desired, we recommend the use of a 60A AGU fuse or MaxiFuse™ type.

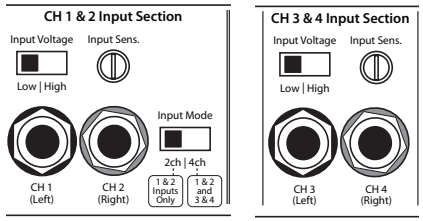
TURN-ON LEAD

The 450/4v2 uses a conventional +12V remote turn-on lead, typically controlled by the source unit's remote turn-on output. The amplifier will turn on when +12V is present at its "**Remote**" input and turn off when +12V is switched off. If a source unit does not have a dedicated remote turn-on output, the amplifier's turn-on lead can be connected to +12V via a switch that derives power from an ignition-switched circuit.

The 450/4v2's "**Remote**" turn-on connector is designed to accept 18 AWG – 8 AWG wire. 12 AWG is more than adequate for this purpose. To connect the remote turn-on wire to the amplifier, first back out the set screw on the top of the amplifier, using the supplied hex wrench. Strip 1/2 inch (12mm) of wire and insert the bare wire into the receptacle on the front panel of the amplifier, seating it firmly so that no bare wire is exposed. When using smaller wire, it may be necessary to strip 1 inch of insulation from the wire and fold the bare wire in half prior to insertion. While holding the wire in the terminal, tighten the set screw firmly, taking care not to strip the head of the screw and making sure that the wire is firmly gripped by the set screw.

CH 1&2 / CH 3&4 INPUT SECTIONS

The 450/4v2 has two separate input sections, one for CH 1&2 and another for CH 3&4. Each section contains a pair of RCA-type input jacks, an "**Input Voltage**" switch and an "**Input Sens.**" rotary control.



The "**CH 1&2 Input Section**" also contains an "**Input Mode**" switch to allow operation of all four amplifier channels with one or two pairs of input signals.

1) Input Mode Switch: If you wish to operate all four channels of the 450/4v2 with a single pair of stereo inputs, select the "**2ch**" position on the "**Input Mode**" switch and connect a single pair of input cables to the input jacks in the "**CH 1&2 Input Section**". In this mode, the amplifier will route the signals connected to the CH 1&2 inputs to CH 3&4 as well.

If you wish to use separate inputs for CH 1&2 and CH 3&4 (to allow front-to-rear fading, for example) and the source unit is equipped with front and rear outputs, select "**4ch**" on the "**Input Mode**" switch located in the "**CH 1&2 Input Section**". In this mode, you must connect separate pairs of input cables to each input section.

2) Input Voltage Range: A wide range of signal input voltages can be accommodated by each of the 450/4v2's input sections (200mV – 8V). This wide range is split up into two sub-ranges, accessible via switches located in each input section of the amplifier. Be aware that each input section's "**Input Voltage**" switch will have to be configured, regardless of how many input cables are actually feeding the amplifier. The "**Low**" position on each "**Input Voltage**" switch selects an input sensitivity range between 200mV and 2V. This means that the "**Input Sens.**" rotary control will operate within that voltage window. If you are using an aftermarket source unit, with conventional preamp-level outputs, this is most likely the position that you will use. The "**High**" position on each "**Input Voltage**" switch selects an input sensitivity range between 800mV and 8V. This is useful for certain high-output preamp level signals as well as speaker-level output from source units and small amplifiers.
To use speaker-level sources, splice the speaker output wires of the source unit or small amplifier onto a pair of RCA plugs for each input pair or use the JL Audio ECS Speaker Wire to RCA adaptor (XB-CLRAIC2-SW).

IMPORTANT

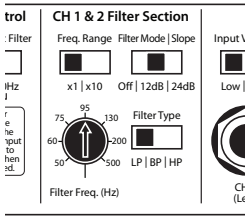
The output of the amplifier will decrease for a given input voltage when the "Input Range" switch is placed in the "High" position. Conversely, the output will be higher with the switch in the "Low" position. While this may sound counter-intuitive, it is correct as described.

3) Input Sensitivity Adjustment: Located next to the "**Input Voltage**" switch in each input section is a rotary control labeled "**Input Sens.**". Once the appropriate "**Input Voltage**" range has been selected, this control can be used to match the source unit's output voltage to the input stage of each pair of amplifier channels for maximum clean output. Rotating the control clockwise will result in higher sensitivity (louder for a given input voltage). Rotating the control counter-clockwise will result in lower sensitivity (quieter for a given input voltage). To properly set each pair of amplifier channels for maximum clean output, please refer to Appendix B (page 22) in this manual. After using this procedure, you can then adjust the relative level of each channel pair by adjusting the input sensitivity downward on either or both channel pairs, if they require attenuation to achieve the desired system balance. Do not increase the "**Input Sens.**" setting for any amplifier in the system beyond the maximum level established during the procedure outlined in Appendix B (page 22). Doing so will result in audible distortion and possible speaker damage. Be aware that both "**Input Sens.**" adjustments will have to be made, regardless of how many input cables are feeding the amplifier. These controls will allow you to set the appropriate relative levels for CH 1&2 relative to CH 3&4 and other amplifier channels in the system.

CROSSOVER CONTROLS

Crossovers are groups of individual electronic filters which allow only certain frequency ranges to pass through them by attenuating frequencies outside the selected range. These filters allow the user to specify what frequency range will be sent out of each channel section of the amplifier. This, in turn, allows each speaker system to only reproduce a range of frequencies it is well-suited for, resulting in reduced distortion and improved fidelity.

CH 1&2 Filter Section:



1) "**Filter Type**" Control: Located in the "**CH 1&2 Filter Section**", this switch allows you to configure the CH 1&2 filter into one of three filter types:

"**LP**" (**Low-Pass**): Configures the CH 1&2 filter to attenuate frequencies above the selected filter frequency. Useful for connection of subwoofer(s) to CH 1&2 in a bi-amplified system.

"**BP**" (Bandpass): Configures the filter to attenuate frequencies above the selected filter frequency and below the frequency selected in the CH 3&4 High-Pass Filter. This creates a true bandpass filter well-suited for driving mid-bass or mid-range speakers in a tri-amplified system.

"**HP**" (**High-Pass**): Configures the CH 1&2 filter to attenuate frequencies below the selected filter frequency. Useful for connection of component speakers to CH 1&2 in a bi-amplified system.

2) "**Filter Mode/Slope**" Control: This switch allows you to defeat the CH 1&2 filter or select from two filter slopes.

"**Off**": Defeats the filter for CH 1&2 completely, allowing the full range of frequencies present at the inputs to feed that pair of channels. This is useful for systems utilizing outboard crossovers or requiring full-range reproduction from that pair of channels.

"**12dB**": Configures the filter for CH 1&2 to attenuate frequencies above or below the selected filter frequency at a rate of 12 dB per octave (Butterworth alignment).

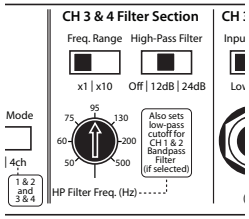
"**24dB**": Configures the filter for CH 1&2 to attenuate frequencies above or below the selected filter frequency at a rate of 24 dB per octave (Linkwitz-Riley alignment).

Depending on the speaker system and the vehicle, different filter slopes may be required to produce a smooth transition between the sound of different speakers in the system. Experiment to find the slope which best matches the acoustic requirements of the system. The sharper "**24dB**" setting will do a better job of protecting small speakers with limited power handling. The shallower "**12dB**" octave setting allows the rear speakers to reproduce more low-frequency content.

3) "**Freq. Range**" Control: When thrown to the right, this switch multiplies the cutoff frequency selected by the rotary "**Filter Freq. (Hz)**" control by a factor of 10. In the "**x1**" position, the range of the rotary control is 50 - 500 Hz (as marked). In the "**x10**" position, the range of the rotary control is 500 Hz - 5 kHz (5000 Hz).

4) "**Filter Freq. (Hz)**" The filter frequency markings surrounding this rotary control are for reference purposes and are generally accurate to within 1/3 octave or better. If you would like to select the filter cutoff frequency with a higher level of precision, consult the charts in Appendix A (page 22) of this manual.

CH 3&4 Filter Section:



1) "**High-Pass Filter**" Control: This switch allows you to defeat the CH 3&4 filter or select from two different filter slopes.

"**Off**": Defeats the filter for CH 3&4 completely, allowing the full range of frequencies present at the inputs to feed that pair of channels. This is useful for systems utilizing outboard crossovers or requiring full-range reproduction from these channels.

"**12dB**": Configures the high-pass filter for CH 3&4 to attenuate frequencies below the selected filter frequency at a rate of 12 dB per octave (Butterworth alignment).

"**24dB**": Configures the high-pass filter for CH 3&4 to attenuate frequencies below the selected filter frequency at a rate of 24 dB per octave (Linkwitz-Riley alignment).

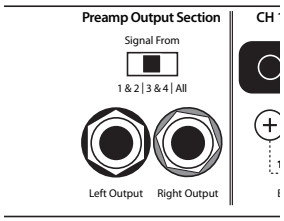
Depending on the speaker system and the vehicle, different filter slopes may be required to produce a smooth transition between the speakers in the system. Experiment to find the slope which best matches the acoustic requirements of your system. The sharper "**24dB**" setting will do a better job of protecting small speakers with limited power handling. The shallower "**12dB**" octave setting allows the rear speakers to reproduce more low-frequency content.

2) "**Freq. Range**" Control: When thrown to the right, this switch multiplies the cutoff frequency selected by the rotary "**Filter Freq. (Hz)**" control by a factor of 10. In the "**x1**" position, the range of the rotary control is 50 - 500 Hz (as marked). In the "**x10**" position, the range of the rotary control is 500 Hz - 5 kHz (5000 Hz).

3) "**Filter Freq. (Hz)**" The filter frequency markings surrounding this rotary control are for reference purposes and are generally accurate to within 1/3 octave or better. If you would like to select the filter cutoff frequency with a higher level of precision, consult the charts in Appendix A (page 22) of this manual.

Preamp Output Section

The 450/4v2 incorporates a pass-through preamp output section, so that additional amplifiers can be added to the system. This pass-through pre-amp output can be configured three different ways using the switch labeled "**Signal From**" in the "**Preamp Output Section**".



1) "**1&2**": The preamp output delivers the same signal that is connected to the 450/4v2's CH 1&2 Inputs. This mode is useful for feeding a subwoofer amplifier when the 450/4v2 is being used to drive front and rear speaker systems. This preamp output mode will track the signal level of CH 1&2, allowing fading of the rear channels without affecting the subwoofer level.

2) "**3&4**": The preamp output delivers the same signal that is connected to the 450/4v2's CH 3&4 Inputs. This mode is useful for feeding a subwoofer amplifier when the 450/4v2 is being used to drive front and rear speaker systems. This preamp output mode will track the signal level of CH 3&4, allowing fading of the front channels without affecting the subwoofer level.

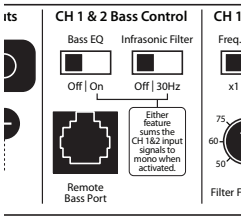
3) "**ALL**": This mode delivers a sum of the signals being fed to the "**CH 1&2 Input Section**" and "**CH 3&4 Input Section**" of the amplifier.

The Preamp Output signal is not affected by the "**LF Boost**" or "**Infrasonic Filter**" processing selected for the amplifier or by any crossover filter selected (if the input signal is full-range, the preamp output will be full-range). When the 450/4v2 is being used to drive front and rear speaker systems, this preamp output mode will deliver a summed front/rear signal to the subwoofer amplifier, while permitting fading of the front and rear speaker systems from the source unit.

Note: The signal level of the "**Preamp Output**" is always low level regardless of the voltage applied to this amplifier's inputs and the setting chosen on this amplifier's **"Input Range"** switch. A JL Audio amplifier receiving signal from this preamp output should have its **"Input Range"** switch set to **"Low"**.

CH 1 & 2 Bass Control

This section provides two basic bass processing tools for CH 1&2: a 24 dB/octave infrasonic filter at 30 Hz and a +6 dB boost circuit centered at 48 Hz. Activation of either feature automatically sums the CH 1&2 input signals to mono. (These features should only be used when driving subwoofer(s) from CH 1&2).


CH 1 & 2 Bass Control
Bass EQ
Infrasonic Filter
Off | On
Off | 30Hz
Either feature sums the CH 1&2 input signals to mono when activated.
Remote Bass Port
x1

1) "**Infrasonic Filter**": The infrasonic filter is a 24 dB/octave high-pass filter, with a fixed cutoff frequency of 30 Hz. This filter is designed to conserve amplifier power and protect subwoofer systems without audibly degrading the sub-bass output. With ported enclosures, the use of the infrasonic filter is highly recommended to protect the speaker(s) from excessive excursion below box tuning. With sealed enclosures, the use of the filter is less necessary, but can still help protect the speaker system. The infrasonic filter can be completely defeated by selecting the "**Off**" position on the "**Infrasonic Filter**" switch. This bypasses all signal from flowing through the circuit.

2) "**Bass EQ**": This switch allows the user to activate a 6 dB boost centered at 48 Hz.

3) "**Remote Bass Port**": Allows you to connect an optional remote boost knob (sold separately, JL Audio Model RBC-1) that can be mounted in the front of the vehicle. With the RBC-1 connected, the boost is no longer limited to 0 or +6 dB, allowing a range of 0-15 dB of boost to be selected.

! IMPORTANT

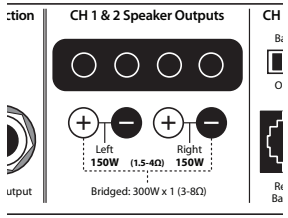
The "Bass EQ" and "Infrasonic Filter" features will only operate when the CH 1&2 filter is activated and in low-pass mode. If you are using an external active crossover and would like to use the "Bass EQ" and "Infrasonic Filter" features, set the "Filter Mode/Slope" switch on "12dB" and rotate the frequency selection knob fully clockwise to the "500 Hz" position. This will activate the bass controls without significantly affecting the crossover point selected by the external active crossover.

SPEAKER OUTPUTS

The 450/4v2 employs JL Audio's exclusive Regulated, Intelligent Power Supply (R.I.P.S.) design. The operation of the R.I.P.S. system is independent for each pair of channels. This sophisticated power supply allows the amplifier to produce its optimum power (150 watts x 2 for channels 1&2 and 75 watts x 2 for channels 3&4) over a wide range of speaker impedances.

Unlike conventional amplifiers that require a specific impedance to produce optimum power, the R.I.P.S.-equipped 450/4v2 gives you the freedom to use a variety of speaker configurations that achieve final nominal impedances between 1.5 – 4Ω per channel in stereo (without sacrificing power output or sound quality). When bridged, each channel pair will optimize output between 3 – 8Ω.

The operation of the R.I.P.S. circuitry is entirely automatic and adjusts itself every time the amplifier is turned on according to the lowest impedance present at the speaker load. There are no user controls to configure. The system operates through multiple stages of impedance optimization, choosing the stage most appropriate to the actual impedance of the speakers you connect to it.



! IMPORTANT

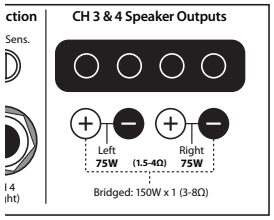
If you connect a load higher than 4Ω nominal per channel in stereo mode (or 8Ω in bridged mode), power will drop by half with every doubling of impedance above 4Ω stereo / 8Ω mono. If you connect a load lower than 1.5Ω nominal per channel in stereo mode (or 3Ω in bridged mode, the amplifier protection circuitry activates a "safe" mode which reduces amplifier power to protect the circuitry from failure (the yellow "Low Ω" LED lights to indicate that this has happened). See page 13 for details.

! IMPORTANT

Speaker loads below 1.5Ω nominal per channel in stereo or 3Ω nominal in bridged mode are not recommended and may cause the amplifier output to distort excessively.

BRIDGING CONSIDERATIONS

Bridging is the practice of combining the output of two amplifier channels to drive a single load. When bridged, each channel produces signals of equal magnitude, but opposite polarity. The combined output of the two channels provides twice the output voltage available from a single channel. The 450/4v2 has been designed for bridging of its channel pairs without the need for input inversion adaptors.



To bridge a pair of channels, use the "**Left +**" and "**Right –**" speaker connectors only (the "**Left –**" and "**Right +**" remain unused). Then connect a mono signal to both left and right RCA inputs for that channel pair. This requires an RCA "Y-Adaptor" like the JL Audio ECS model XB-CLRAICY-1F2M (sold separately). When bridged, each channel pair will deliver optimum power into a 3-8Ω load. Operating bridged channel pairs into a load lower than 3Ω is not recommended.

Because a bridged pair of channels requires that both channels receive input, you need to connect both left and right RCA inputs to the bridged channel pair's inputs. Connection of only one RCA input will result in reduced power output, increased distortion and can cause the amplifier to overheat. Do not do this! Instead, use a "Y-adaptor" to split the mono signal into both left and right RCA inputs.

STATUS INDICATOR LIGHTS / PROTECTION CIRCUITRY

There are three status indicator lights on the top of the amplifier. These are as follows:

1) "**Power**" (**Green**): lights to indicate that the amplifier is turned on and operating normally.

2) "**Thermal**" (**Red**): lights to indicate that the amplifier has exceeded its safe operating temperature, putting the amplifier into a self-protection mode, which reduces the power output of the amplifier. The red light will shut off and the amplifier will return to normal, full-power operating mode if the heat sink temperature drops back to a safe level.

3) "**Low Ω**" (**Amber**): lights to indicate that the impedance of the speaker load connected to the amplifier is lower than the optimum load impedance range for the amplifier. When this light is on, a protection circuit engages and reduces the power output of CH 1&2 or CH 3&4, depending on which channel is experiencing the problem. The amber indicator will also light when a short-circuit is detected in the speaker wiring (this can be a short between the positive and negative speaker wires or between either speaker wire and the vehicle chassis). This can be used to diagnose a short-circuit by only connecting one of the amplifier sections at a time (CH 1&2 and CH 3&4). The amber LED will light when you connect the section that is experiencing the problem and turn the volume up.

There is only one condition that will shut down an undamaged 450/4v2 completely…

If battery voltage drops below 10 volts, the entire amplifier will shut itself off. The green "Power" indicator on the top of the amplifier will turn off when this occurs. The amplifier will turn back on when voltage climbs back above 10 volts. This may happen in a rapid cycle when bass-heavy program material causes a weak charging system to dip below 10 volts momentarily. If this is happening in your system, have your charging system inspected to make sure it is working properly. For information on troubleshooting this amplifier, refer to Appendix C (page 24).

SERVICING YOUR JL AUDIO AMPLIFIER

If your amplifier fails or malfunctions, please return it to your authorized JL Audio dealer so that it may be sent in to JL Audio for service. There are no user serviceable parts or fuses inside the amplifier. The unique nature of the circuitry in the JL Audio amplifiers requires specifically trained service personnel. Do not attempt to service the amplifier yourself or through unauthorized repair facilities. This will not only void the warranty, but may result in the creation of more problems within the amplifier.

If you have any questions about the installation or setup of the amplifier not covered in this manual, please contact your dealer or technical support.

JL Audio Technical Support:
(954) 443-1100
9:00 AM – 5:30 PM (Eastern Time Zone)
Monday - Friday

SYSTEM CONFIGURATIONS

The 450/4v2 is a very flexible amplifier, well-suited for a multitude of system configurations. In this section, the most likely configurations are explained in detail.

Once you have selected your desired configuration, you can use the amplifier panel drawings on the bottom of the following pages to mark the required switch positions for easy reference.

BI-AMPLIFIED SYSTEMS

Bi-amplified systems are defined as systems in which separate amplifier channels drive low-frequency (LF) and high-frequency (HF) speakers and are separately filtered to send appropriate frequency ranges to each speaker system.

The most common application of bi-amplification in mobile audio is to drive a subwoofer system from one or more amplifiers or channels and component speakers from separate amplifiers or channels.

The 450/4v2 can be configured to drive a bi-amplified system by itself or with a separate subwoofer amplifier.

Bi-Amplified System with one 450/4v2

In this configuration, CH 1&2 of the 450/4v2 will drive subwoofers (stereo 150W x 2 or bridged 300W x 1) with low-pass filtering. CH 3&4 will drive component speakers in stereo (75W x 2) with high-pass filtering.

Input connection options for a bi-amplified system with one 450/4v2 are as follows:

A) <u>No User Adjustability</u>

Required: a basic source unit or processor with left and right stereo outputs.

Input Connections: a single pair of stereo source unit outputs connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**").

Result: the relative level of the LF and HF channels will be fixed by the 450/4v2's "**Input Sens.**" settings and will not be user adjustable from the front of the vehicle.

B) <u>Fade Subwoofer Level vs. HF Level</u>

Required: a source unit or processor with front and rear pairs of outputs.

Input Connections: the first stereo pair of source unit outputs is connected to the CH 1&2 inputs of the 450/4v2. The second stereo pair of source unit outputs is connected to the CH 3&4 inputs (select "**4ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**").

Result: in this mode, the user has the ability to fade or control the level of the LF channels relative to the HF channels via the source unit's fader control without exceeding the maximum clean output level set by each amplifier section's "**Input Sens.**" controls.

C) <u>Subwoofer Level Control Only</u>

Required: a source unit or processor with left, right and subwoofer outputs.

Input Connections: the main stereo pair of source unit outputs is connected to the CH 3&4 inputs of the 450/4v2. The source unit's dedicated subwoofer output is connected to the CH 1&2 inputs (select "**4ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**").

Result: in this mode, the user has the ability to control the absolute level of the LF channels relative to the HF channels.

! IMPORTANT

Set the CH 1&2 "Input Sens." with the source unit's subwoofer level control set at 3/4 of full output. See Appendix B (page 22) for details.

Crossover Setup for Bi-Amplified System with one 450/4v2:

Once the input sections have been configured appropriately, go to the "**CH 1&2 Filter Section**". Select "**x1**" on the "**Freq. Range**" switch, "**LP**" (low-pass) on the "**Filter Type**" switch and "**12dB**" or "**24dB**" on the "**Filter Mode/Slope**" switch and an appropriate "**Filter Freq**." (80-90 Hz is a good starting point). You may also choose to activate the "**Infrasonic Filter**" and/or "**Bass EQ**" features in the "**CH 1&2 Bass Control**" section. Please keep in mind that activation of the "**Bass EQ**" may require lowering the CH 1&2 "**Input Sens**." to maintain clean maximum output.

Next, turn your attention to the "**CH 3&4 Input Section**" and select "**x1**" on the "**Freq. Range**" switch, "**HP**" (high-pass) on the "**Filter Type**" switch and "**12dB**" or "**24dB**" on the "**Filter Mode/Slope**" switch and an appropriate "**Filter Freq.**" (again, 80-90 Hz is a good starting point).

After proper adjustment of the CH 1&2 and CH 3&4 "**Input Range**" and "**Input Sens.**" controls using the method shown in Appendix B (page 22), you can fine tune filter frequencies and slopes and attenuate either pair of channels to achieve proper balance. For precise filter frequency information refer to Appendix A (page 22).

Bi-Amplified System with one 450/4v2 in four-channel mode and a separate subwoofer amplifier

This configuration requires that the separate subwoofer amplifier has a built-in low-pass filter. All JL Audio subwoofer amplifiers have this feature.

In this configuration, CH 1&2 of the 450/4v2 will drive front component speakers (stereo 150W x 2) with high-pass filtering. CH 3&4 will drive rear component speakers in stereo (75W x 2) with high-pass filtering.

The separate amplifier will drive the subwoofer system with low-pass filtering (select a filter frequency of 80-90 Hz to start). The inputs of the subwoofer amplifier may or may not be connected to the preamp outputs of the 450/4v2, depending on which connection option you choose.

Input connection options for a bi-amplifier system with one 450/4v2 and a separate subwoofer amplifier are as follows:

A) <u>No User Adjustability</u>

Required: a basic source unit or processor with left and right stereo outputs.

Input Connections: a single pair of stereo source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). Connect the subwoofer amplifier inputs to the preamp outputs of the 450/4v2 (Select "**1&2**" on the "Signal From" switch in the "**Preamp Output Section**").

Result: the relative level of the LF and front and rear HF channels will be fixed by the 450/4v2's "**Input Sens.**" settings and will not be user adjustable from the front of the vehicle.

B) <u>Fade Subwoofer Level vs. HF Level</u>

Required: a source unit or processor with front and rear pairs of stereo outputs.

Input Connections: one stereo pair of source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). The second stereo pair of source unit outputs is connected to the subwoofer amplifier inputs. In this mode, the 450/4v2's preamp output is not used.

Result: with this option, the user has the ability to fade the level of the subwoofer amplifier's input relative to the HF channels, but cannot control front-to-rear fading of the HF channels. The relative level of the front and rear HF channels will be fixed by the 450/4v2's "**Input Sens.**" settings and will not be user adjustable from the front of the vehicle.

C) Fade HF Front to Rear with Non-Fading Subwoofer Level

Required: a source unit or processor with front and rear pairs of stereo outputs.

Input Connections: one stereo pair of source unit outputs-is connected to the CH 1&2 inputs of the 450/4v2 (select "**4ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). The second stereo pair of source unit outputs is connected to the CH 3&4 inputs of the 450/4v2. Connect the subwoofer amplifier inputs to the preamp outputs of the 450/4v2 (Select "**ALL**" on the "**Signal From**" switch in the "**Preamp Output Section**").

Result: with this option, the user has the ability to fade the HF signals from front-to-rear without fading the signal to the subwoofer amplifier.

D) Subwoofer Level Control Only

Required: a source unit or processor with left, right and dedicated subwoofer outputs.

Input Connections: The main stereo pair of source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). The source unit's dedicated subwoofer output is connected to the subwoofer amplifier inputs. In this mode, the 450/4v2's preamp output is not used.

Result: with this option, the user has the ability to control the absolute level of the subwoofer channel relative to the HF channels, but cannot fade the front and rear HF channels relative to each other.

! IMPORTANT

Set the CH 1&2 "Input Sens." with the source unit's subwoofer level control set at 3/4 of full output. See Appendix B (page 20) for details.

E) Front to Rear HF Fading and Subwoofer Level Control

Required: a source unit or processor with front and rear pairs of stereo outputs plus a dedicated subwoofer output.

Input Connections: one stereo pair (front, typically) of source unit outputs is connected to the CH 1&2 inputs of the 450/4v2. The second stereo pair of source unit outputs (rear, typically) is connected to the CH 3&4 inputs of the 450/4v2 (select "**4ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). The source unit's dedicated subwoofer output is connected to the subwoofer amplifier inputs. In this mode, the 450/4v2's preamp output is not used.

Result: with this option, the user has the ability to fade the front and rear HF channels relative to each other and also has the ability to control the absolute level of the subwoofer channel relative to the HF channels.

! IMPORTANT

Set the CH 1&2 "Input Sens." with the source unit's subwoofer level control set at 3/4 of full output. See Appendix B (page 20) for details.

Crossover Setup for Bi-Amplified System with one 450/4v2 and a separate subwoofer amplifier:

Once the input and preamp output sections have been configured appropriately, go to the "**CH 1&2 Filter Section**". Select "**x1**" on the "**Freq. Range**" switch, "**HP**" (high-pass) on the "Filter Type" switch and "**12dB**" or "**24dB**" on the "Filter **Mode/Slop**e" switch and an appropriate "**Filter Freq.**" (80-90 Hz is a good starting point). The "**Infrasonic Filter**" and "**Bass EQ**" features cannot be used in this mode.

Next, turn your attention to the "**CH 3&4 Input Section**" and select "**x1**" on the "**Freq. Range**" switch, "**HP**" (high-pass) on the "**Filter Type**" switch and "**12dB**" or "**24dB**" on the "**Filter Mode/Slope**" switch and an appropriate "**Filter Freq.**" (again, 80-90 Hz is a good starting point).

After proper adjustment of the 450/4v2's CH 1&2 and CH 3&4, and the subwoofer amplifier's "**Input Range**" and "**Input Sens.**", you can fine tune filter frequencies and slopes and attenuate either pair of channels to achieve proper balance. For proper adjustment of the "**Input Sens.**" controls of the 450/4v2 use the method shown in Appendix B (page 22). For precise filter frequency information for the 450/4v2 refer to Appendix A (page 22). Refer to the subwoofer amplifier owner's manual for proper adjustments.

Bi-Amplified 3.1 System with one 450/4v2 in three-channel mode and a separate subwoofer amplifier

This configuration requires a separate subwoofer amplifier with a built-in low-pass filter. All JL Audio subwoofer amplifiers have this feature.

The separate amplifier will drive the subwoofer system with low-pass filtering (select a filter frequency of 80-90 Hz to start). The inputs of the subwoofer amplifier will be connected to the preamp outputs of the 450/4v2 or to the source unit or multi-channel processor directly.

In this configuration, CH 1&2 of the 450/4v2 will drive front-left and front-right component speakers (stereo 150W x 2) with high-pass filtering. CH 3&4 will be bridged mono to drive a center-front component speaker system (150W x 1) with high-pass filtering. All three channels will have equal power at 3 – 4Ω.

Input connection options for bi-amplified 3.1 system with one 450/4v2 and a separate subwoofer amplifier:

A) Real Left-Center-Right Channels and Subwoofer with Multi-Channel Source

Required: a multi-channel processor or source unit (Dolby Digital®, Dolby ProLogic II®, dts®, etc.) with center channel output.

Input Connections: the left-front and right-front source unit outputs are connected to the CH 1&2 inputs of the 450/4v2 and the front-center channel output of the source unit or processor is connected to the CH 3&4 inputs of the 450/4v2 (select "**4ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). Use a "Y-adaptor" like the JL Audio ECS model XB-CLRAICY-1F2M (sold separately) to feed both RCA jacks on the amplifier from the single signal cable. Most multi-channel processors and source units are also equipped with a dedicated subwoofer output and subwoofer level control. Connect this subwoofer output directly to the subwoofer amplifier's inputs. The 450/4v2's preamp outputs are not used.

Result: True left, center and right channels with multi-channel material, derived center channel with stereo material. Rear-surround channels are unused. User adjustability of left, center and right channels depends on source unit/processor. Subwoofer level is user adjustable.

! IMPORTANT

Set the subwoofer amplifier's "Input Sens." with the source unit's subwoofer level control set at 3/4 of full output. Refer to the subwoofer amplifier owner's manual for proper adjustment.

! IMPORTANT

The "Summed Center Channel" methods outlined below do not create a true center channel, they simply sum left and right signals to the center speaker system. This is not as desirable as a true center channel from a multi-channel source, but it can be used to create a convincing sound stage in some applications.

B) "Summed Center Channel", No User Adjustability

Required: a basic source unit or processor with left and right stereo outputs.

Input Connections: a single pair of stereo source unit outputs, connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). Connect the subwoofer amplifier inputs to the preamp outputs of the 450/4v2 (Select "**1&2**" on the "**Signal From**" switch in the "**Preamp Output Section**").

Result: the relative level of all channels will be fixed by the 450/4v2's "**Input Sens.**" settings and will not be user adjustable from the front of the vehicle.

C) Fade Between "Summed Center Channel" Level and Left/Right Level with Non-Fading Subwoofer Level

Required: a source unit or processor with front and rear pairs of stereo outputs.

Input Connections: one pair of stereo source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**4ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). A second pair of source unit outputs is connected to the CH 3&4 inputs. Connect the subwoofer amplifier inputs to the preamp outputs of the 450/4v2 (Select "**ALL**" on the "**Signal From**" switch in the "**Preamp Output Section**").

Result: with this option, the user has the ability to adjust the relative level of the "Summed Center Channel" input relative to the Left and Right channel pair via the source unit's fader control. Subwoofer is non-fading.

D) Fade Between "Summed Center Channel" Level and Left/Right Level with Separate Subwoofer Level Control

Required: a source unit or processor with front and rear pairs of stereo outputs plus a dedicated subwoofer output.

Input Connections: one pair of stereo source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**4ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). A second pair of source unit outputs is connected to the CH 3&4 inputs. The source unit's dedicated subwoofer output is connected to the subwoofer amplifier's inputs. In this mode, the 450/4v2's preamp output is not used.

Result: with this option, the user has the ability to fade between the "Summed Center Channel" level and the Left and Right channel levels via the source unit's fader control and also has the ability to control the absolute level of the subwoofer channel relative to the three HF channels with the source unit's subwoofer level control.

! IMPORTANT

Set the subwoofer amplifier's "Input Sens." with the source unit's subwoofer level control set at 3/4 of full output. Refer to the subwoofer amplifier owner's manual for proper adjustment.

Crossover setup for bi-amplified 3.1 system with one 450/4v2 and a separate subwoofer amplifier:

Once the input and preamp output sections have been configured appropriately, go to the "**CH 1&2 Filter Section**". Select "**x1**" on the "**Freq. Range**" switch, "**HP**" (high-pass) on the "**Filter Type**" switch and "**12dB**" or "**24dB**" on the "**Filter Mode/Slope**" switch and an appropriate "**Filter Freq.**" (80-90 Hz is a good starting point). The "**Infrasonic Filter**" and "**Bass EQ**" features cannot be used in this mode.

Next, turn your attention to the "**CH 3&4 Input Section**" and select "**x1**" on the "**Freq. Range**" switch, "**HP**" (high-pass) on the "**Filter Type**" switch and "**12dB**" or "**24dB**" on the "**Filter Mode/Slope**" switch and an appropriate "**Filter Freq.**" (again, 80-90 Hz is a good starting point).

After proper adjustment of the 450/4v2's CH 1&2 and CH 3&4, and the subwoofer amplifier's "**Input Range**" and "**Input Sens.**", you can fine tune filter frequencies and slopes and attenuate the center channel or the left and right channel pair with the "**Input Sens.**" controls to achieve proper balance. For proper adjustment of the "**Input Sens.**" controls of the 450/4v2 use the method shown in Appendix B (page 22). For precise filter frequency information for the 450/4v2 refer to Appendix A (page 22). Refer to the subwoofer amplifier owner's manual for proper adjustments.

Bi-Amplified 5.1 System with Multi-Channel Source, one 450/4v2 in three-channel mode, a JL Audio 300/2 amplifier driving rear surround speakers and a separate subwoofer amplifier
(JL Audio 500/1v2 or 1000/1v2 recommended)

This configuration is identical to the 3.1 system configuration with Input Option A, except for the addition of a JL Audio 300/2v2 two-channel amplifier to drive rear surround speakers, effectively creating a true 5.1 multi-channel system with left-front, center-front, right-front, left-rear and left-right channels.

The 300/2v2 in two-channel stereo mode is perfectly matched to the 450/4v2 in three channel Left, Center, Right mode. The system will deliver 150 W x 5 to power the component speaker systems plus the output of an additional amplifier to the subwoofer system.

To add this capability, connect the 300/2v2's inputs to the rear (surround) outputs of a multi-channel processor or source unit and set the 300/2v2's "**Amp Filter**" in "**HP**" mode with a "**12dB**" or "**24dB**" filter slope.

TRI-AMPLIFIED SYSTEMS

Tri-amplified systems are defined as systems in which separate amplifier channels drive low-frequency (LF), mid-frequency (MF) and high-frequency (HF) speakers and are separately filtered to send appropriate frequency ranges to each speaker system.

The most common application of tri-amplification in mobile audio is to drive a subwoofer system from one or more amplifiers or channels (LF channels), mid-range speakers from a separate amplifier or set of channels (MF channels) and high-frequency speakers from a separate amplifier or set of channels (HF channels). One such configuration is to run subwoofers off the LF channel(s), mid-bass speakers off the MF channels, and a passively crossed over mid/high frequency component speaker systems on the HF channels. Another approach is to run subwoofers off the LF channel(s), mid-woofers off the MF channels and tweeters off the HF channels (all actively crossed over).

By activating the CH 1&2 bandpass filter feature, the 450/4v2 can easily be configured to drive a tri-amplified system in conjunction with a separate subwoofer amplifier that includes a low-pass filter. CH 3&4 of the 450/1 will drive the HF speakers (75W x 2), CH 1&2 will drive the MF speakers (150W x 2) and the separate subwoofer amp(s) will drive the LF speakers (subwoofers).

Input connection options for the Tri-Amplified Stereo mode are as follows:

A) <u>No User Adjustability</u>

Required: a basic source unit or processor with left and right stereo outputs.

Input Connections: a single pair of stereo source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**"). Subwoofer amplifier inputs are connected to the preamp outputs of the 450/4v2 (Select "**1&2**" on the "**Signal From**" switch in the "**Preamp Output Section**").

Result: the relative level of all channels will be fixed by the 450/4v2's "**Input Sens.**" settings and will not be user adjustable from the front of the vehicle.

B) <u>Fade Subwoofer Level vs. MF/HF Level</u>

Required: a source unit or processor with front and rear pairs of outputs is required.

Input Connections: one stereo pair of source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**") and the second stereo pair of source unit outputs is connected to the subwoofer amplifier inputs. In this mode, the 450/4v2's preamp output is not used.

Result: the user has the ability to adjust the level of the subwoofer channel relative to the mid and high-frequency channels via the source unit's fader control, without exceeding the maximum clean output level set by each amplifier section's "**Input Sens.**" controls.

C) <u>Subwoofer Level Control Only</u>

Required: a source unit or processor with left, right and dedicated subwoofer outputs is required.

Input Connections: one stereo pair of source unit outputs is connected to the CH 1&2 inputs of the 450/4v2 (select "**2ch**" on the "**Input Mode**" switch in the "**CH 1&2 Input Section**") and the source unit's dedicated subwoofer output is connected to the subwoofer amplifier inputs. In this mode, the 450/4v2's preamp output is not used.

Result: the user has the ability to control the absolute level of the subwoofer channel relative to the MF and HF channels.

! IMPORTANT

Set the subwoofer amplifier's "Input Sens." with the source unit's subwoofer level control set at 3/4 of full output. Refer to the subwoofer amplifier owner's manual for proper adjustment.

Crossover setup for tri-amplified 3.1 system with one 450/4v2 and a separate subwoofer amplifier:

Once the input and preamp output sections have been configured appropriately, go to the "**CH 1&2 Filter Section**" of the 450/4v2. These settings will determine the high-pass cutoff and slope of the bandpass filtering applied to the MF (mid-frequency) channels. Select "**x1**" on the "**Freq. Range**" switch, "**BP**" (bandpass) on the "**Filter Type**" switch and "**12dB**" or "**24dB**" on the "**Filter Mode/Slope**" switch and an appropriate "**Filter Freq.**" (80-90 Hz is a good starting point). The "**Infrasonic Filter**" and "**Bass EQ**" features cannot be used in this mode.

Next, turn your attention to the "**CH 3&4 Input Section**". These settings will determine the high-pass cutoff and slope of the high pass filtering applied to the HF (high-frequency) channels as well as the low-pass cutoff frequency and slope for the MF channels' bandpass filter. Select "**x1**" on the "**Freq. Range**" switch if your desired MF to HF crossover frequency is below 500 Hz. Select "**x10**" on the "**Freq. Range**" switch if your desired MF to HF crossover frequency is above 500 Hz. Select "**HP**" (high-pass) on the "**Filter Type**" switch and "**12dB**" or "**24dB**" on the "**Filter Mode/Slope**" switch and an appropriate "**Filter Freq.**"

After proper adjustment of the 450/4v2's CH 1&2 and CH 3&4, and the subwoofer amplifier's "**Input Range**" and "**Input Sens.**", you can fine tune filter frequencies and slopes and attenuate the LF, MF and HF channel pair or with the "**Input Sens.**" controls to achieve proper balance.

For proper adjustment of the "**Input Sens.**" controls of the 450/4v2 use the method shown in Appendix B (page 22). For precise filter frequency information for the 450/4v2 refer to Appendix A (page 22). Refer to the subwoofer amplifier owner's manual for proper adjustments.

APPENDIX A:
Precise Frequency Selection Chart

"FILTER FREQ" CH 1&2 / CH 3&4		
Detent Number	**Panel Marking**	**Actual Freq.**
Full counter-clockwise: 58		
01		58
02	"50"	58
03		58
04		58
05		59
06		60
07		61
08	"60"	63
09		65
10		67
11		69
12		71
13		74
14	"75"	77
15		80
16		82
17		85
18		90
19		93
20	"95"	97
21		102
22		107
23		113
24		120
25		127
26	"130"	135
27		143
28		153
29		171
30		182
31		201
32	"200"	223
33		253
34		289
35		337
36		404
37		474
38	"500"	514
Full-clockwise: 542		

APPENDIX B:
Input Sensitivity Level Setting

APPENDIX A:
Input Sensitivity Level Setting

JL Audio amplifiers utilizing the Regulated Intelligent Power Supply (R.I.P.S.) allow delivery of their rated power when connected to any load impedance from 1.5 - 4Ω per channel and when connected to a charging system with any voltage from 11 - 14.5V. This design is beneficial for many reasons. One of these reasons is ease of setup. Because each JL Audio amplifier will always deliver the same amount of power within its operational range of impedances and supply voltages, the maximum, unclipped output is very predictable.

This makes setting the gain structure via the input sensitivity controls very simple. Following the directions below will allow the user to adjust the input sensitivity of the amplifier(s) simply and easily in just a few minutes using equipment which is commonly available in installation bays.

Necessary Equipment

- Digital AC Voltmeter
- CD with a sine-wave test tone recorded at 0 dB reference level in the frequency range to be amplified for that set of channels (50 Hz for subwoofer channels, 1 kHz for a midrange application). The CleanSweep® Calibration Disc contains the appropriate test tones and is available for sale at http://store.jlaudio.com Do not use attenuated test tones (-10 dB, -20 dB, etc.).

The Nine-Step Procedure

(follow this procedure for each pair of channels)

1) Disconnect the speaker(s) from the amplifier's "**Front Speaker Outputs**" and "**Rear Speaker Outputs**" connectors.

2) Turn off all processing on the source unit (bass/treble, loudness, EQ, etc.). Set fader control to center position and subwoofer level control to 3/4 of maximum (if used to drive the 450/4v2).

3) Switch the "**Input Voltage**" to "**Low**" and turn the "**Input Sens.**" control on both sets of channels all the way down.

4) Set the source unit volume to 3/4 of full volume. If either set of channels is being driven by a source unit's dedicated subwoofer output, also adjust the source unit's subwoofer level control to 3/4 of maximum output. This will allow for reasonable gain overlap with moderate clipping at full volume.

5) Using the chart below, determine the target voltage for input sensitivity adjustment according to the nominal impedance of the speaker system connected to each set of outputs.

6) Verify that you have disconnected the speakers before proceeding. Play a track with an appropriate sine wave (within the frequency range to be amplified by each set of channels) at 3/4 source unit volume.

7) Connect the AC voltmeter to the "**CH 1&2 Speaker Outputs**" or "**CH 3&4 Speaker Outputs**" connectors of the amplifier. If the channel pair is operating in stereo, it is only necessary to measure one channel. If bridged, make sure you test the voltage at the correct connectors (L+ and R–).

8) Increase the "**Input Sens**." control until the target voltage is delivered for that set of channels. If excessive voltage is read on either set of channels with the control at minimum (full counterclockwise), switch the appropriate "**Input Voltage**" switch to "**High**" and re-adjust.

9) Once you have adjusted each set of channels to its maximum unclipped output level, reconnect the speaker(s). The "**Input Sens.**" controls can now be adjusted downward if either or both sets of channels requires attenuation to achieve the desired system balance.

! IMPORTANT

Do not increase any "Input Sens." setting in the system beyond the maximum level established during this procedure. Doing so will result in audible distortion and possible speaker damage.

It will be necessary to re-adjust the "**Input Sens.**" for the affected channels if any equalizer boost is activated after setting the "**Input Sens.**" with this procedure. This applies to any EQ boost circuit, including the amplifier's "**Bass EQ**" and source unit tone controls or EQ circuits. EQ cuts will not require re-adjustment.

Nom. Impedance	CHANNELS 1&2		CHANNELS 3&4	
	Stereo	Bridged	Stereo	Bridged
8Ω	24.5 V	49.0 V	17.3 V	34.6 V
6Ω	24.5 V	42.4 V	17.3 V	30.0 V
4Ω	24.5 V	34.6 V	17.3 V	24.5 V
3Ω	21.2 V	30.0 V	15.0 V	21.2 V
2Ω	17.3 V	**not recommended**	12.2 V	**not recommended**
1.5Ω	15.0 V	**not recommended**	10.6 V	**not recommended**

APPENDIX C: TROUBLE SHOOTING

"How do I properly set the input sensitivity on my amplifier"

Please refer to Appendix B (page 22) to set the input sensitivity for maximum, low-distortion output.

"My amplifier doesn't turn on"

Check the fuse, not just visually, but with a continuity meter. It is possible for a fuse to have poor internal connections that cannot be found by visual inspection. It is best to take the fuse out of the holder for testing. If no problem is found with the fuse, inspect the fuse-holder.

Check the integrity of the connections made to each of the "**+12VDC**", "**Ground**", and "**Remote**" terminals. Ensure that no wire insulation is pinched by the terminal set screw and that each connection is tight.

Check to make sure there is +12V at the **"Remote"** connection of the amplifier. In some cases, the turn-on lead from the source unit is insufficient to turn on multiple devices and the use of a relay is required. To test for this problem, jump the "**+12VDC**" wire to the "**Remote**" terminal to see if the amplifier turns on.

"I get a distorted / attenuated sound coming out of the speaker(s)"

Check the speaker wires for a possible short, either between the positive and negative leads or between either speaker lead and the vehicle's chassis ground. If a short is present, you will experience distorted and/or attenuated output. The "**Low Ω**" light will illuminate in this situation. It may be helpful to disconnect the speaker wires from the amplifier and use a different set of wires connected to a test speaker.

Check the nominal load impedance to verify that each channel of the amplifier is driving a load equal to or greater than 1.5 ohms in stereo mode (3 ohms bridged).

Check the input signal and input signal cables to make sure signal is present at the **"Amplifier Inputs"** and the cables are not pinched or loose. It may be helpful to try a different set of cables and/or a different signal source to be sure.

"My amplifier's output fluctuates when I tap on it or hit a bump"

Check the connections to the amplifier. Make sure that the insulation for all wires has been stripped back far enough to allow a good contact area inside the terminal block.

Check the input connectors to ensure that they all are making good contact with the input jacks on the amplifier.

"My amplifier shuts off once in a while, usually at higher volumes"

Check your voltage source and grounding point. The power supply of the 450/4v2 will operate with charging system voltages down to 10V. Shutdown problems at higher volume levels can occur when the charging system voltage drops below 10V. These dips can be of very short duration making them extremely difficult to detect with a common DC voltmeter. To ensure proper voltage, inspect all wiring and termination points. It may also be necessary to upgrade the ground wire connecting the battery to the vehicle's chassis and the power wire connecting the alternator to the battery. Many vehicles employ small (10 AWG - 6 AWG) wire to ground the battery to the vehicle's chassis and to connect the alternator to the battery. To prevent voltage drops, these wires should be upgraded to 4 AWG when installing amplifier systems with main fuse ratings above 60A. **Grounding problems are the leading cause of misdiagnosed amplifier "failures."**

"My amplifier turns on, but there is no output"

Check the input signal using an AC voltmeter to measure the voltage from the source unit while an appropriate test tone is played through the source unit (disconnect the input cables from the amplifier prior to this test). The frequency used should be in the range that is to be amplified by the amplifier (example: 50 Hz for a sub bass application or 1 kHz for a full range / high-pass application). A steady, sufficient voltage (between 200mV and 8.0-volts) should be present at the output of the signal cables.

Check the output of the amplifier. Using the procedure explained in the previous check item (after plugging the input cables back into the amplifier) test for output at the speaker outputs of the amplifier. Unless you enjoy test tones at high levels, it is a good idea to remove the speaker wires from the amplifier while doing this. Turn the volume up approximately half way. 5V or more should be measured at the speaker outputs. This output level can vary greatly between amplifiers but it should not be in the millivolt range with the source unit at half volume. If you are reading sufficient voltage, check your speaker connections as explained below.

Check to ensure that the speaker wires are making a good connection with the metal inside the terminal block. The speaker wire connectors are designed to accept up to 8 AWG wire. Make sure to strip the wire to allow for a sufficient connection with the metal inside the terminal block.

APPENDIX D:
450/4v2 Specifications

General Specifications:

Recommended Fuse Value: 60A
Recommended Fuse Type: AFS, AGU or MaxiFuse™

Input Sections:

No. of Inputs: Two Stereo Pairs (CH 1&2, CH 3&4)
Input Type: Differential-balanced with RCA jack inputs
Input Range: Switchable from 200mV - 2V RMS to 800mV - 8V RMS

Channels 1 & 2:

Amplifier Topology: Class A/B with patented Absolute Symmetry™ dual N-Channel MOSFET output design
Power Supply: Independent, pulse width modulation-regulated switching power supply with multistage impedance optimizing circuitry.
Rated Power (Stereo):
150W RMS x 2 @ 1.5-4Ω (11V - 14.5V)
Rated Power (Bridged):
300W RMS x 1 @ 3-8Ω (11V - 14.5V)
THD at Rated Power: <0.03% @ 4Ω per channel (20 Hz-20 kHz)
Signal to Noise Ratio: >108.5 dB referred to rated power (A-weighted, 20 Hz-20 kHz noise bandwidth)
Frequency Response: 5 Hz - 30 kHz (+0, -1dB)
Damping Factor: >200 @ 4Ω per ch. / 50 Hz, >100 @ 2Ω per ch. / 50 Hz
Slew Rate: ± 25V/µs
CH 1&2 Filter: State-variable, 12 dB/octave Butterworth or 24 dB/octave Linkwitz-Riley Low-Pass or High-Pass with continuously variable cutoff frequency from 50 - 500 Hz, switchable to a range of 500 - 5000 Hz, via x10 switch. Can also be cascaded from Channel 3&4 filter's cutoff frequency to operate as a bandpass filter for tri-amp configurations. Defeatable.
LF Boost: Single-band, fixed-frequency (48 Hz), fixed "Q" +6 dB boost. Defeatable. Port for optional remote bass control to provide variable boost control from 0 to +15 dB.
Infrasonic Filter: 24 dB/octave @ 30 Hz, defeatable.

Channels 3 & 4:

Amplifier Topology: Class A/B with patented Absolute Symmetry™ dual N-Channel MOSFET output design
Power Supply: Independent, pulse width modulation-regulated switching power supply with multistage impedance optimizing circuitry.
Rated Power (Stereo):
75W RMS x 2 @ 1.5 - 4Ω (11V - 14.5V)
Rated Power (Bridged):
150W RMS x 1 @ 3 - 8Ω (11V - 14.5V)
THD at Rated Power: <0.03% @ 4Ω per channel (20 Hz - 20 kHz)
Signal to Noise Ratio: >108.5 dB referred to rated power (A-weighted, 20 Hz - 20 kHz noise bandwidth)
Frequency Response: 5 Hz - 30 kHz (+0, -1 dB)
Damping Factor: >200 @ 4Ω per ch. / 50 Hz, >100 @ 2Ω per ch. / 50 Hz
Slew Rate: ± 25V/µs
Channel 3&4 Filter: State-variable, 12 dB/octave Butterworth or 24 dB/octave Linkwitz-Riley High-Pass with continuously variable cutoff frequency from 50 - 500 Hz, switchable to a range of 500 - 5000 Hz, via x10 switch.

Preamp Output:

2-Channel pass-through type, switch-selectable to pass signal from CH 1&2 inputs only, from CH 3&4 inputs only or from all four inputs (summed).

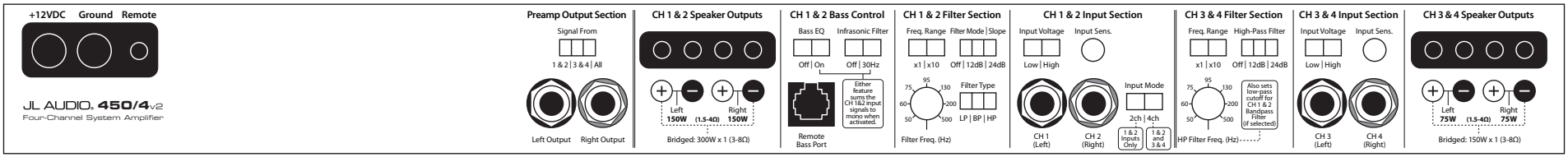
Dimensions (LxWxH):

19.70 in. x 9.25 in. x 2.36 in. (500 mm x 235 mm x 60 mm)

Due to ongoing product development, all specifications are subject to change without notice.

INSTALLATION NOTES:

Use this diagram to document your amplifier's switch and control positions.



LIMITED WARRANTY - AMPLIFIERS (USA)

JL AUDIO warrants this product to be free of defects in materials and workmanship for a period of ninety (90) days from the original date of purchase. The warranty term is extended to two (2) years if installation is performed or approved by an authorized JL AUDIO dealer (proof of installation or approval required on purchase receipt).

This warranty is not transferrable and applies only to the original purchaser from an authorized JL AUDIO dealer. Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction, JL AUDIO will (at its discretion), repair or replace the defective product with new or remanufactured product at no charge. Damage caused by the following is not covered under warranty: accident, misuse, abuse, product modification or neglect, failure to follow installation instructions, unauthorized repair attempts, misrepresentations by the seller. This warranty does not cover incidental or consequential damages and does not cover the cost of removing or reinstalling the unit(s). Cosmetic damage due to accident or normal wear and tear is not covered under warranty.

Warranty is void if the product's serial number has been removed or defaced.

Any applicable implied warranties are limited in duration to the period of the express warranty as provided herein beginning with the date of the original purchase at retail, and no warranties, whether express or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties, therefore these exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If you need service on your JL AUDIO product:

All warranty returns should be sent to JL AUDIO 's Amplifier Service Facility freight-prepaid through an authorized JL AUDIO dealer and must be accompanied by proof of purchase (a copy of the original sales receipt). Direct returns from consumers or non-authorized dealers will be refused unless specifically authorized by JL AUDIO with a valid return authorization number.

Warranty expiration on products returned without proof of purchase will be determined from the manufacturing date code. Coverage may be invalidated as this date is previous to purchase date. Non-defective items received will be returned freight-collect. Customer is responsible for shipping charges and insurance in sending the product to JL AUDIO. Freight damage on returns is not covered under warranty.

For Service Information in the U.S.A. please call
JL Audio Customer Service: (954) 443-1100
9:00 AM – 5:30 PM (Eastern Time Zone)
JL Audio, Inc
10369 North Commerce Pkwy.
Miramar, FL 33025
(do not send product for repair to this address)

International Warranties:
Products purchased outside the United States of America are covered only by that country's distributor and not by JL Audio, Inc.

Absolute Symmetry™ Class A/B Amplifier Circuit is covered by U.S. Patent #6,294,959 and is pending in the countries listed below. Austria, Belgium, Brazil, Canada, China, France, Germany, Indonesia, Italy, Japan, Republic of Korea, Mexico, Netherlands, Norway, Russian Federation, Singapore, Sweden, Switzerland, United Kingdom, and all other PCT countries.